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REMARKS

Please reconsider the application in view of the above amendments and the following remarks. Applicant thanks the Examiner for carefully considering this application.

Disposition of Claims

Claims 1-9, 12, 13, 15, 17-24, 30-32, 34-40, 51, 52, and 55-60 are pending in this application. Claims 1, 12, 31, 35, 37, 51, 52, 56, and 59 are independent. Claims 10, 11, 14, 16, 25, 26, 28, 29, 33, 39-50, 53, and 54 have been withdrawn. The remaining claims depend, directly or indirectly, from claims 1, 12, 31, 35, 37, 56, and 59.

Rejection(s) under 35 U.S.C § 103

REJECTIONS OF CLAIMS 1-9, 18-21, 27, 30, 35 AND 36:

Claims 1-9, 18-21, 27, 30, 35, and 36 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over U.S. Patent No. 4,145,740 ("McClean") in view of U.S. Patent No. 4,172,562 ("Smith"). This rejection is respectfully traversed.

Independent claims 1 and 35 each recite a system for winding fibers onto an article that includes a winding station having at least one fiber bobbin and a conveyor, wherein the conveyor is adapted to move the article of indeterminate length axially through the winding station. The use of a conveyor to move the article axially through the winding apparatus allows for the continuous application of fibers to an article of indeterminate length. The winding apparatus provides a rotational movement to wind the fibers while the article moves axially through the winding apparatus. Advantageously, the claimed system provides the ability to process long continuous articles, *e.g.*, such as the tubing used in petroleum wellbores, in addition to discrete articles, *e.g.*, segments of continuously made tubing (page 4, lines 25-29). Thus, the system and method of the present invention allows a continuously-made tubing having a length of tens of thousands of feet (page 9, lines 5-10).

In contrast, the cited prior art does not show or suggest a means to produce the types of articles disclosed by the present invention. As discussed in the previous responses, Smith discloses a winding station and a track system for moving the article

axially and rotationally, and McClean discloses a winding station that moves axially and a mechanism for rotating the article. The combination of Smith and McClean as suggested by the Examiner would not be capable of scaling up to handle articles of extended length in an equivalent manner to the present invention. Smith, in particular, operates on a reciprocating track system with carriers on the end that rotate and axially translate the article. To scale this system up would require an extensive track system that would be complex and expensive if it were even possible. Moreover, Smith is absolutely silent to such an application. Additionally, rotating the article as in Smith and McClean would result in a twisting of the article over the extended length. The twisting of the article that would occur in Smith and McClean would greatly reduce the accuracy of laying the fiber and potentially damage the article during manufacture. The twist of the article and the resulting decrease in accuracy of fiber application would be proportional to the length of the article. In contrast, the present invention produces no twist on the article because the fiber winder performs the rotation.

The Examiner asserts that the decision to rotate the article or the fiber winder simply depends on the article of concern. The combination of Smith and McClean neither show nor suggest a means of rotating the winding station as required by the claims of the present invention. A person skilled in the art would not have had the motivation to combine them and modify them in this manner. Additionally, rotating the winding station versus the article is not a simple choice to make. As those having ordinary skill will appreciate, there is much greater complexity in developing a system where the fiber winder rotates continuously around the rotationally fixed article as the article is axially translated through the winder. The simple means for rotation of the article provided in Smith and McClean in which the ends of an article are rotated is similar to that of a machining lathe. The ability to accommodate articles of extended length would be similarly limited. In contrast, the claimed invention can accommodate long continuous articles as well as the discrete length articles that Smith and McClean are capable of. In view of the above, McClean and Smith, whether considered separately or in combination, fail to show or suggest the present invention as recited in the independent claim 1.

In independent claim 35, in addition to the winding station and the conveyor, the above-mentioned system further includes a resin ring with dynamic seals coupled to the winding station, wherein the fibers are impregnated with resin prior to winding onto the article. In contrast, Smith discloses a continuous slot or other closely spaced aperture where the resin is applied to the fibers. Smith neither shows nor suggests a dynamic seal as disclosed in the present invention. The Examiner asserts that the dynamic seal is an obvious variation of Smith. The resin applicator of the prior art simply passes the fiber through a container of resin. The application may be uneven and/or excessive. This leads to an inconsistent product and inefficient use of resin. In contrast, the wiping effect of the dynamic seals of the present invention provides the desired amount of resin in a consistent manner. The Examiner provides no evidence that would support the variation of Smith to include a dynamic seal.

The present invention advantageously provides, therefore, a system that can manufacture articles that would be impossible to manufacture by a combination of Smith and McClean.

In view of the above, McClean and Smith, whether considered separately or in combination, fail to show or suggest the present invention as recited in independent claims 1 and 35. Thus, these claims are patentable over McClean in view of Smith. The remaining claims depend, either directly or indirectly, from claims 1 and 35, and, thus, are allowable for at least the same reasons. Accordingly, withdrawal of this rejection is respectfully requested.

REJECTION OF CLAIM 22:

Claim 22 stands rejected under 35 U.S.C. § 103(a) as being unpatentable over McClean in view of Smith, as applied above to claim 1, and further in view of U.S. Patent No. 3,970,495 ("Ashton"). This rejection is respectfully traversed. As described above with respect to independent claim 1, McClean and Smith fail to show or suggest the present invention as claimed. Further, Ashton fails to provide that which McClean and Smith lack with respect to the present invention, whether considered separately or in combination. Thus, claim 22, which depends from claim 1, is patentable over McClean

in view of Smith and Ashton. Accordingly, withdrawal of this rejection is respectfully requested.

REJECTIONS OF CLAIMS 12 AND 17:

Claims 12 and 17 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over McClean in view of Smith, as applied above to claim 1, and further in view of and U.S. Patent No. 4,359,356 ("Kornbichler"). Claim 12 has been amended into independent form in this reply to include all the limitations of claim 1. As described above with respect to independent claim 1, McClean and Smith fail to show or suggest the limitations recited in claim 1. To the extent that the examiner still maintains the rejection of the amended claim 12, that rejection is respectfully traversed. In amended claim 12, the above-mentioned system further includes a sensor and a controller operatively coupled to the sensor and a selectively operable brake to maintain the desired tension on the fibers.

The selectively operable brake of the present invention allows for the operator to adjust the mechanical properties of the long continuous articles as they proceed through the winding apparatus (page 10, lines 28-30). For example, tensile strength may be increased on one end of the tubing, while flexibility, burst pressure, and reduced weight are emphasized on the opposite end. This transition in mechanical properties can occur gradually over the entire length of the article. This may be particularly advantageous when long sections of tubing are involved. In that case, the desired mechanical properties may vary gradually from end to end.

In contrast, Kornbichler discloses a mechanical friction brake, an eddy current brake, and a tension equalizing device (column 4, lines 20-23). In contrast to claim 12, the braking provided by Kornbichler is *fixed*. The function of the fixed braking of Kornbichler is to "keep the tension of the fibers and thus the removal rate from bobbin approximately constant." (column 5, lines 27-30). Kornbichler, in combination with Smith and McClean, neither shows nor suggests a means to vary the tension during fiber winding on the same article. The Examiner has provided no convincing line of reasoning as to why one of ordinary skill in the art would have been motivated to combine Smith, McClean, and Kornbichler and then modify them in the manner of the present invention.

Thus, claim 12, for these reasons and those provided for claim 1, is patentable over McClean in view of Smith and Kornbichler. Claim 17 depends from claim 12, and, thus, is allowable for at least the same reasons. Accordingly, withdrawal of this rejection is respectfully requested.

REJECTIONS OF CLAIMS 13-15 AND 23-25:

Claims 13-15 and 23-25 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over McClean in view of Smith and Kornbichler, as applied above to claim 12, and further in view of U.S. Patent No. 5,032,211 ("Shinno"). This rejection is respectfully traversed. Claims 13 and 23 are respectively dependent on the amended claim 12 and claim 1. As described above with respect to claim 12, McClean, Smith, and Kornbichler, fail to show or suggest the present invention as disclosed in claim 12. Further, Shinno fails to provide that which McClean, Smith, and Kornbichler lack with respect to the present invention, whether considered separately or in combination. As described above with respect to claim 1, McClean and Smith fail to show or suggest the invention in claim 1. Further, Shinno and Kornbichler fail to provide that which McClean and Smith lack with respect to the current invention, whether considered separately or in combination. Thus, claims 13 and 25, which depend respectively from claims 12 and 1, are patentable over McClean in view of Smith, Kornbichler, and Shinno. Claim 14-15 and claims 24-25 respectively depend from claims 12 and 23, and, thus, are allowable for at least the same reasons. Accordingly, withdrawal of this rejection is respectfully requested.

REJECTION OF CLAIM 31:

Claim 31 stands rejected under 35 U.S.C. § 103(a) as being unpatentable over Kornbichler in view of Smith. This rejection is respectfully traversed.

Independent claim 31 recites a system for winding fibers onto an article that includes a winding station having at least one fiber bobbin, a conveyor, and a selectively operable brake rotationally coupled to the at least one fiber bobbin. The conveyor is adapted to move the article axially through the winding station.

The Examiner asserts that the combination of the winding station and conveyor

from Smith when combined with the brake from Kornbichler would produce an equivalent to the present invention. However, as is described above with respect to claims 1 and 12, such a combination fails to show or suggest the present invention in independent claim 31. Further, it is noted that Kornbichler also rotates the article in a similar manner to Smith and McClean(discussed in claim 1) instead of rotating the fiber winder as in the present invention.

In view of the above, Kornbichler and Smith, whether considered separately or in combination, fail to show or suggest the present invention as recited in independent claim 31. Thus, this claim is patentable over Kornbichler in view of Smith. Accordingly, withdrawal of this rejection is respectfully requested.

REJECTIONS OF CLAIMS 32-34 AND 37-39:

Claims 32-34 and 37-39 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Kornbichler in view of Smith as applied above to claim 31, and further in view of Shinno. This rejection is respectfully traversed.

Independent claim 37 recites a system for winding fibers onto an article that includes a winding station having at least one fiber bobbin, a conveyor, and a detector coupled to a controller. The conveyor is adapted to move the article axially through the winding station.

As described above with respect to independent claim 31, Kornbichler and Smith fail to show or suggest the present invention as claimed. The Examiner asserts that Shinno produces discloses a torque sensor in an equivalent manner to the present invention. The Applicant respectfully disagrees. The torque control system of Shinno is concerned with the dispensing and take-up reels of a composite tape application mechanism (column 3, lines 50-62). The approach of Shinno deals with the constant changes in rotational inertia of the dispensing and take-up reels as the radii respectively decrease and increase during the tape application process. Further, the approach of Shinno is to maintain a constant tension in a similar manner to Kornbichler. In contrast, the present invention is capable of varying the tension over the entire article as noted in the discussion of claim 12. Additionally, Shinno rotates the article instead of the winder. This further illustrates the novelty of rotating the fiber winder in the present invention as

was discussed in claim 1.

As described above with respect to independent claim 31, Kornbichler and Smith, whether in combination or separately, fail to show or suggest the present invention as claimed. Further, Shinno fails to provide that which Kornbichler and Smith lack with respect to the present invention, whether considered separately or in combination. Thus, claim 32, which depends from claim 31, is patentable over Shinno in view of Smith and Kornbichler. Likewise, claim 37, which discloses a system having conveyor similar to the conveyor disclosed in claim 31, is patentable over Shinno in view of Smith and Kornbichler. Claims 33-34 and 38-39 respectively depend from claims 32 and 37, and, thus, are allowable for at least the same reasons. Accordingly, withdrawal of this rejection is respectfully requested.

REJECTIONS OF CLAIMS 51, 52 AND 55:

Claims 51, 52, and 55 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Kornbichler in view of Smith, McClean and Shinno. This rejection is respectfully traversed.

Independent claims 51 and 52 each recite a system for winding fibers onto an article that includes a winding station having at least one fiber bobbin and a conveyor, wherein the conveyor is adapted to move the article axially through the winding station. In claim 51, the above-mentioned system further includes a plurality of sensors, a controller, a resin ring, a controllable force brake, and a detector. In claim 52, in addition to the winding station and the conveyor, the above-mentioned system further includes a detector coupled to a controller.

As is shown above, claims 51 and 52 each disclose a system having conveyor similar to the conveyor disclosed in claim 31. As described above with respect to independent claim 31, Kornbichler and Smith fail to show or suggest the present invention as claimed. Further, McClean and Shinno fail to provide that which Kornbichler and Smith lack with respect to the present invention, whether considered separately or in combination. Thus, claims 51 and 52 are patentable over Kornbichler in view of Smith, McClean and Shinno. Claim 55 depends from claim 52, and, thus, is allowable for at least the same reasons. Accordingly, withdrawal of this rejection is

respectfully requested.

REJECTIONS OF CLAIMS 56-60:

Claims 56-60 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Kornbichler in view of Smith, McClean, Shinno as applied above to claim 51, and further in view of U.S. Patent No. 5,942,059 ("Wulker"). This rejection is respectfully traversed.

Independent claims 56 and 59 each recite a system for winding fibers onto an article that includes a winding station having at least one fiber bobbin and a conveyor, wherein the conveyor is adapted to move the article axially through the winding station. In claim 56, the above-mentioned system further includes a brake rotationally coupled to the at least one fiber bobbin, a sensor, and a controller coupled to the brake and the sensor. In claim 59, in addition to the winding station and the conveyor, the above-mentioned system further includes a sensor and a controller coupled to the sensor.

As is shown above, claims 56 and 59 each disclose a system having conveyor similar to the conveyor disclosed in claim 51. As described above with respect to independent claim 51, Kornbichler, Smith, McClean, and Shinno fail to show or suggest the present invention as claimed. Further, Wulker fails to provide that which Kornbichler, Smith, McClean, and Shinno lack with respect to the present invention, whether considered separately or in combination. Additionally, Wulker rotates the article instead of the winder. This further illustrates the novelty of rotating the fiber winder in the present invention as was discussed in claim 1. Thus, claims 56 and 59 are patentable over Kornbichler in view of Smith, McClean and Shinno. Claims 57-58 and claim 60 respectively depend from claims 56 and 59, and, thus, are allowable for at least the same reasons. Accordingly, withdrawal of this rejection is respectfully requested.

Conclusion

Applicant believes this reply to be fully responsive to all outstanding issues and place this application in condition for allowance. If this belief is incorrect, or other issues arise, do not hesitate to contact the undersigned or his associates at the telephone number listed below. Please apply any charges not covered, or any credits, to Deposit Account 50-0591 (Reference Number 09432.130002).

Respectfully submitted,

Date: 4/17/03

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